

REMARKS

This Amendment is in response to the Office Action dated March 16, 2004. In the Office Action, the Examiner rejected claims 1-3, 8, and 24 under 35 U.S.C. § 102(e) as being anticipated by Or *et al.*, U.S. Patent No. 6,532,237 (hereinafter Or). Claims 4-7, 914, 20-23, and 25-28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Or. Claims 15-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Or in view of Erriksson *et al.*, U.S. Patent No. 6,243,384. Claims 15, 23, and 25 were rejected under 35 U.S.C. § 112, second paragraph, for indefiniteness. Claims 5, 11, 15, 18 and 26 were objected to for various informalities. The drawings were also objected to for various informalities.

Claims 9, 11, 15, 18, 23, 25, 26 and 28 are amended as shown above. Claims 1-28 remain pending in the application. For the reasons set forth below, the Applicants respectfully request reconsideration and allowance of all pending claims.

Objection to the Drawings

Figs. 1, 2, 3, and 6 were objected to for use of the term "TYP." Applicants respectfully assert this objection is improper. The term "TYP" is short for Typical, and is commonly shown in parenthesis so as to identify it is not a part of the reference or reference number. It is commonly used in drawings to indicate a particular element is typical of similar elements. For example, in Fig. 2, the term (TYP) is used to identify a peer group is defined by an oval.

This also relates to the use of two reference characters pointing to the same drawing element. This is by intent in Fig. 2. Normally, each element would be given a numeric number. However, to better clarify the hierarchical structure of ATM, the ATM naming convention is used. Thus, a peer group is identified by PG(A.1) rather than a number, such as 20. At the same time, Fig. 2 shows text identifying typical elements, such as PEER GROUP (TYP), and PEER GROUP LEADER (TYP). These are used to

indicate that an oval depicts a typical peer group, while a blackened circle within a peer group oval depicts the leader of that peer group. In essence, the use of the plain English nomenclature makes it easier to understand Fig. 2, without requiring the viewer to have to read the corresponding text in the specification.

Applicants respectfully request to allow the use of the term “(TYP)” and the plain text labels to remain in Figs. 1, 2, 3, and 6.

As to the Figure number “Fig.. 2”, this has been corrected in the attached replacement drawing sheet for Figure 2.

As to Fig. 10, applicants respectfully assert the language “Debug IE information” in block 114 is proper. This relates to information contained in the debug information element – the information contained in the debug IE is extracted. The debug IE is not extracted, as it already is in an extracted form (it is an information element).

Claim Objections

With respect to the use of the language “receiving results **of** at least one failure diagnostic function from a network,” applicants request to not amend this language, as it is appropriate. A failure diagnostic function produces a result or multiple results. The results are “of” the failure diagnostic function, i.e., the result “of” doing something (performing the failure diagnostic function). The use of the terminology “receiving results **on** at least at least one failure diagnostic function” is not appropriate.

With respect to item b), correction has been made to claim 11.

With respect to items c) and d), claim 15 has been amended to clarify this language. Applicants respectfully assert the language of claim is now clear.

With respect to item e), correction has been made to claim 18

With respect to item f), correction has been made to claim 26.

Claim Rejections – 35 U.S.C. § 112

With respect to the § 112, second paragraph rejections, applicants have amended each of claims 15, 23, and 25 to provide proper antecedent basis.

Claim Rejections - 35 U.S.C. § 102

Claims 1-3, 8 and 24 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application No. 6,532,237 to Or et al (Or). Applicant respectfully traverse the instant §102(e) rejections.

A claim is anticipated only if each and every element of the claim is found in a single reference. M.P.E.P § 2131 (citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 (Fed. Cir. 1987)). “The identical invention must be shown in as complete detail as is contained in the claim.” M.P.E.P. § 2131 (citing *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226 (Fed. Cir. 1989)). Independent claim 1 recites in pertinent part, “performing at least one diagnostic function on the network switching device in response to information contained in the debug Information Element (IE).” Applicants respectfully submit that Or fails to teach or fairly suggest the use of a debug information element as recited in claim 1.

In support of the rejection of claim 1, the Examiner equates a debug IE to a PSTE (“PNNI Topology State Element”) and a data packet to an ASCII file. Furthermore, the Examiner asserts that parsing a file is the same as extracting a debug IE from a data packet. Additionally, the Examiner asserts that simulating a portion of an ATM network based on PSTEs that are received by an ATM node is equivalent to performing at least one diagnostic function on a network switching device in response to information contained in the debug IE.

Under the claimed invention of claim 1, a debug IE is encoded with information to trigger a diagnosis function on a switching device. More specifically, details of one embodiment of the debug ID are shown in Figures 8 and 9, along with corresponding

discussion in the specification. For example, the following discussion contained in the specification begins at the top of page 23:

An exemplary format for implementing the debug IE of the present invention is shown in FIGURE 9. The format includes an 8-bit header 70, an 8-bit protocol field 72, a length of the IE field 74, and a variable-length field 76 in which the contents of the IE are held. In octet 2, bits 7 and 6 are assigned a value of "1 1" to identify that this IE corresponds to the ATM forum specifications. *Bit 5 is set to "1" to indicate that explicit instructions are to be followed. Bit 4 is set to "1" to indicate a pass along request. Bits 3-1 are set to "0 0 1" to indicate to discard the IE and proceed.* **Under this exemplary format, the IE information is encoded such that switching devices that receive the IE and understand the requested action will execute the action, while switching devices that do not understand the action will simply ignore the action and pass the IE along to subsequent switching devices along the connection path.** (Page 23, lines 1-12, Emphasis added)

In one exemplary embodiment, the debug IE content field may contain information that instructs each switching device supplied by a particular vendor (or multiple vendors if a common multi-vendor scheme is adapted) to activate its diagnostic functions, or a particular diagnostic function (page 23, lines 19-22). The debug IE might inform a particular switching device to perform a full set of failure analysis functions, or prescribe only (a) particular function(s) to be run (page 24, lines 16-18).

In contrast, a PTSE is not an information element, and there is no information contained in a PTSE that causes any diagnostic function (identified by the information) to be performed.

PTSEs contain information used to describe network topology. More specifically,

PTSEs are the smallest collection of PNNI routing information that is flooded as a unit among all logical nodes within a peer group. A node topology database consists of a collection of all PTSEs received, which represent that particular node's present view of the PNNI routing topology. The topology database provides all the information required to compute a route from the given source node to any destination address reachable in or through that routing domain. (see *Or et al.* col.3 lines 29-38)

PTSEs injected into the real PNNI node under test have the following identification parameters [to **define network topology**]: 1. Peer Group ID; 2. Origination Node ID; 3. PTSE ID; 4. PTSE Sequence

Number; 5. PTSE type--one of the following: a) nodal information that describes the node type and its summary information; b) horizontal link that describes all incoming and outgoing communication links with neighbors, i.e., the network topology; c) summary address information that comprises ATM information advertised by each node (not mandatory). (see *Or* et al. col.12 line 65 – col.13 line 22, text in brackets added)

It is clear from above that a PTSE does not contain any information from which a diagnostic function can be identified, and thus no diagnostic function would be performed in response to information contained in a PTSE. Furthermore, the node under test in *Or* is configured to perform a predefined simulation test, not a diagnostic function – the same simulation test is performed regardless of the configuration or number of PTSE that are provided to the test node.

In addition, an ASCII file is not a data packet, nor is it reasonable to construe equivalence between the two. A data packet has a predefined structure, while an ASCII file does not. An ASCII file could not be propagated along a connection path in an ATM network (or any other network, for that matter) by itself. Rather, the ASCII file contents would need to be contained within one or more network data packets.

In further detail, the ASCII file is not even received over an ATM link. Rather, the (ASCII) injection file is written to the node under test:

Once the injection file is complete, it is inserted or injected into the node under test using the method of FIG. 4. With reference to FIG. 4, the file is first generated then **written to the node under test** that parses the contents of the file. PTSEs are built in binary form, including checksums, and then processed using the routines normally responsible for processing PTSEs when received over a link from other nodes. The processed data is written to the node's topology database. Finally, the results of the subsequent flooding and routing processes as well as the statistics are analyzed and verified to ensure correct operation of the network. (Col. 13, lines 39-49, emphasis added)

Furthermore detail, the injection file is not even transported over one of the links for the network for which the node under test is connected. Rather, the injection file is transferred via a communication link such as a serial link. Specifically, as shown in Fig. 2, "A PTSE injection device 96 is connected via any suitable communication link 98

such as a serial link, e.g., RS-232, to the node under test 27 (Col 11, lines 13-16). The link between the PTSE injection device 96 and the node under test 27 **is not part of the real or virtual ATM network.**

It is clear that *Or* does not teach or suggest receiving a data packet containing a debug information element at a network switching device, extract the debug information element from the data packet, or perform at least one diagnostic function on the network switching device in response to information contained in the debug information element. Consequently, *Or* fails to disclose each and every claim element of claim 1. Accordingly, Applicants request the instant §102(e) rejection for claim 1 be withdrawn.

Dependent claim 2 recites in pertinent part, “communicating results of said at least one diagnostic function from the network switching device to a selected end point connected to the network switching device via communications link.” Applicants submit that *Or* fails to disclose, teach or fairly suggest communicating result of diagnostic function to an end point connected to the network switching device via a communication link, such as depicted in Figure 6 of the present application. *Or* discloses that the local PTSEs generation routine is modified, causing the node to generate a PTSE describing the simulated link, and connecting the real PNI node to a logical node. Thus *Or* discloses the steps of modifying PTSEs in real nodes to describe the topology of a simulated network. Such steps are not directed toward the communication of diagnostic results. Accordingly, Applicants request that the instant §102 rejection be withdrawn.

Dependent claim 3 recites in pertinent part, “the debug IE is embedded in a connection management message.” The cited reference does not disclose the use of a connection management message. The PTSEs are injected using an ASCII file, as discussed above. ATM networks employ connection management message (contained in corresponding data packets) to initiate, acknowledge, and release connections. Thus Applicants request that the §102 rejection for claim 3 be withdrawn.

Independent claim 24 recites in pertinent part, "performing at least one diagnostic function on a network switching device in response to information contained in the debug IE." For the reason discussed above, Applicants submit that *Or* fails to disclose a debug IE and consequently fails to anticipate independent claim 24. Accordingly, Applicants request the instant §102(e) rejection for independent claim 24 be withdrawn.

Claim Rejections - 35 U.S.C. § 103

Claims 4-7, 9-14, 20-23 and 25-28 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Or*. Claims 15-19 are further rejected under 35 U.S.C. §103(a) as being unpatentable over *Or* in view of U.S. Patent No. 6,243,384 to Eriksson *et al*.

To establish a *prima facie* case of obviousness, there must first be some suggestion or motivation to modify a reference or to combine references, and second be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. M.P.E.P. § 706.02(j) from *In Re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under § 103 requires, *inter alia*, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed device; and (2) whether the prior art would also have revealed that in so making, those of ordinary skill would have a reasonable expectation of success. Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the Applicants' disclosure. *Amgen v. Chugai Pharmaceutical*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991), *Fritsch v. Lin*, 21 USPQ2d 1731 (Bd. Pat. App. & Int'f 1991). An invention is non-obvious if the references fail not only to expressly disclose the claimed invention as a whole, but also

to suggest to one of ordinary skill in the art modifications needed to meet all the claim limitations. *Litton Industrial Products, Inc. v. Solid State Systems Corp.*, 755 F.2d 158, 164, 225 USPQ 34, 38 (Fed. Cir. 1985).

The examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. M.P.E.P. § 70602(j) from *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). Obviousness cannot be established by combining references without also providing evidence of the motivating force which would impel one skilled in the art to do what the patent applicant has done. M.P.E.P. § 2144 from *Ex parte Levengood*, 28 USPQ2d 1300, 1302 (Bd. Pat. App. & Inter. 1993) (emphasis added by M.P.E.P.).

Independent claim 5 recites in pertinent parts, “a method for diagnosing a failure in network switching device comprising: embedding a debug information element (IE) in a message; receiving results of at least one failure diagnostic function from a network switching device configured to respond to the debug IE, wherein the debug IE is formatted so as to be propagated transparently across network switching devices that are not configured to recognize the debug IE.” Thus claim 5 claims a method to debug a failed network switching device wherein IE encoded with debug information propagates across a network and triggers diagnostic functions in selected switching device configured to respond to the debug IE. Applicants submit that *Or* fails to teach or suggest such a configuration.

Figure 2 of *Or* illustrates an example hierarchical PNNI ATM network divided into a real physical portion and a simulated virtual portion. Figure 3 of *Or* illustrates the PTSE injection method. Figure 4 of *Or* illustrates the PTSE node incorporation method in more detail. Figure 5 of *Or* illustrates the record that is repeated in the injection output file. Finally, Figure 6 of *Or* illustrates an example virtual hierarchical PNNI ATM network that is simulated and injected into the test node to aid in testing and debugging.

Applicants submit that *Or* fails to teach or suggest method to debug a failed network switching device. The claimed subject matter is non-obvious over the configuration taught in *Or* for several reasons. First, *Or* is directed towards the **simulation** of a virtual ATM network, which **can aid subsequent testing and analysis** of the network. In contrast, the present invention concerns **the actual method for debugging failures** of network switching device(s) in an existing network. Second, *Or* fails to disclose a debug IE encoded with debug information for at least the same reason as discussed above in connection with claim 1. Moreover, *Or* does not disclose or even suggest a network switching device that is configured to perform a diagnosis function in response to information encoded in a debug IE. Furthermore, *Or* does not teach or suggest propagating an IE across a network to reach a target switching device while transparently bypassing the other switching devices. Consequently, *Or* fails to expressly or impliedly suggest the invention of claim 5. For the foregoing reasons, Applicants respectfully request that the instant §103(a) rejection for claim 5 be withdrawn.

Amended independent claim 9 recites “a method for diagnosing a failure in a connection establishment path comprising a plurality of nodes in a communication network, comprising: embedding a debug information element (IE) in a data packet; propagating the data packet to a plurality of switching devices corresponding to respective nodes along the connection path; extracting the debug IE at selected switching devices among said plurality of switching devices; and performing at least one diagnostic function on targeted switching devices among said selected switching devices in response to information contained in the debug IE.” Thus claim 9 recites a method to debug multiple failures along a network connection path using debug IEs. Therefore the Applicants submit that claim 9 is non-obvious over *Or* for at least the same reasons discussed above in connection with independent claim 5. Accordingly, Applicants request that the instant §103(a) rejection be withdrawn.

Independent claim 26 recites in pertinent parts, “generating a debug information element (IE) having a format so that it may be propagated transparently across a network of switching devices that are not configured to recognize the debug IE; embedding the debug IE in a message; and receiving results of at least one failure diagnostic function from a network switching device configured to respond to the debug IE.” Thus claim 26 recites performing diagnosis function on network switching devices in response to information received from debug IE. Therefore the Applicants submit that claim 26 is non-obvious over *Or* for at least the same reasons discussed above in connection with independent claim 5. Accordingly, Applicants request that the instant §103(a) rejection be withdrawn.

Dependent claims 6-8, 10-23, 25, and 27-28 are patentable over the prior art of record for at least the same reasons as discussed above in connection with their respective independent claims, in addition to adding further limitations of their own. Accordingly, Applicants respectfully request that the applicable §102 and §103 rejections for claims 2-4, 6-8, 10-23, 25, and 27-28 be withdrawn.

CONCLUSION

Overall, none of the references singly or in any motivated combination disclose, teach, or suggest what is recited in the independent claims. Thus, given the above amendments and accompanying remarks, independent claims 1, 5, 9, 24, and 26 are now in condition for allowance. The dependent claims that depend directly or indirectly on these independent claims are likewise allowable based on at least the same reasons and based on the recitations contained in each dependent claim.

If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to the allowability of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any

informalities or questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned attorney at (206) 292-8600.

Charge Deposit Account

Please charge our Deposit Account No. 02-2666 for any additional fee(s) that may be due in this matter, and please credit the same deposit account for any overpayment.

Respectfully submitted,

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Enclosures: Substitute drawing sheet for Figure 2.